

TGFβ₁ (hBA-112): sc-4561

BACKGROUND

Transforming growth factor βs (TGFβs) were originally discovered due to their ability to promote anchorage-independent growth of rat NRK fibroblasts in the presence of TGFβ. It is now realized that TGFβs mediate many cell-cell interactions that occur during embryonic development. Three TGFβs have been identified in mammals. TGFβ₁, TGFβ₂ and TGFβ₃ are each synthesized as precursor proteins that are very similar in that each is cleaved to yield a 112 amino acid polypeptide that remains associated with the latent portion of the molecules. Biologically active TGFβ requires dimerization of the monomers (usually homodimers) and release of the latent peptide portion. Overall, the mature region of the TGFβ₃ protein has approximately 80% identity to the mature region of both TGFβ₁ and TGFβ₂. However, the NH₂ terminals (or precursor regions) of their molecules share only 27% sequence identity.

REFERENCES

1. Todaro, G.J., et al. 1980. Transforming growth factors produced by certain human tumor cells: polypeptides that interact with epidermal growth factor receptors. *Proc. Natl. Acad. Sci. USA* 77: 5258-5262.
2. Anzano, M.A., et al. 1983. Sarcoma growth factor from conditioned medium of virally transformed cells is composed of both type α and type β transforming growth factors. *Proc. Natl. Acad. Sci. USA* 80: 6264-6268.
3. Derynck, R., et al. 1985. Human transforming growth factor-β cDNA sequence and expression in tumor cell lines. *Nature* 316: 701-705.
4. deMartin, R., et al. 1987. Complementary DNA for human glioblastoma-derived factor-β family. *EMBO J.* 6: 3673-3677.
5. ten Dijke, P., et al. 1988. Identification of a new member of the transforming growth factor type β gene family. *Proc. Natl. Acad. Sci. USA* 85: 4715-4719.
7. Wakefield, L.M., et al. 1989. Recombinant TGFβ₁ is synthesized as a two component latent complex that shares some structural features with the native latent TGFβ₁ complex. *Growth Factors* 1: 203-218.
8. ten Dijke, P., et al. 1990. Recombinant expression and purification of transforming growth factor-β₃, a potent growth regulator. *Ann. N.Y. Acad. Sci.* 593: 36-42.
6. Miller, D.A., et al. 1990. Transforming growth factor β: a family of growth regulatory peptides. *Ann. N.Y. Acad. Sci.* 593: 208-217.

CHROMOSOMAL LOCATION

Genetic locus: TGFβ₁ (human) mapping to 19q13.1; Tgfb1 (mouse) mapping to 7 A3.

SOURCE

TGFβ₁ (hBA-112) is produced in *E. coli* as 40 kDa biologically active, GST-tagged fusion protein corresponding to 112 amino acids of human TGFβ₁.

PRODUCT

TGFβ₁ (hBA-112) is purified from bacterial lysates (> 98%); supplied as 50 μg purified protein.

BIOLOGICAL ACTIVITY

TGFβ₁ (hBA-112) is biologically active as determined by its ability to inhibit the mouse IL-4-dependent proliferation of mouse HT-2 cells.

Expected ED₅₀: < 0.05 ng/ml.

Specific Activity: Greater than 2 x 10⁷ units/mg.

RECONSTITUTION

In order to avoid freeze/thaw damaging of the active protein, dilute protein when first used to desired working concentration. Either a sterile filtered standard buffer (such as 50mM TRIS or 1X PBS) or water can be used for the dilution. Store any thawed aliquot in refrigeration at 2° C to 8° C for up to four weeks, and any frozen aliquot at -20° C to -80° C for up to one year. It is recommended that frozen aliquots be given an amount of standard cryo-preserved (such as Ethylene Glycol or Glycerol 5-20% v/v), and refrigerated samples be given an amount of carrier protein (such as heat inactivated FBS or BSA to 0.1% v/v) or non-ionic detergent (such as Triton X-100 or Tween 20 to 0.005% v/v), to aid stability during storage.

SELECT PRODUCT CITATIONS

1. Lu, Y.Z., et al. 2005. Molecular mechanisms responsible for microglia-derived protection of Sprague-Dawley rat brain cells during *in vitro* ischemia. *Neurosci Lett.* 373: 159-164.
2. Kidd, M., et al. 2007. Small bowel carcinoid (enterochromaffin cell) neoplasia exhibits transforming growth factor-β₁-mediated regulatory abnormalities including up-regulation of C-Myc and MTA1. *Cancer* 109: 2420-2431.
3. Kwon, Y.J., et al. 2013. Anabolic effects of Peniel 2000, a peptide that regulates TGF-β₁ signaling on intervertebral disc degeneration. *Spine* 38: E49-E58.
4. Park, S.H., et al. 2014. Melittin inhibits TGF-β-induced pro-fibrotic gene expression through the suppression of the TGFβRII-Smad, ERK1/2 and JNK-mediated signaling pathway. *Am. J. Chin. Med.* 42: 1139-1152.

STORAGE

Store desiccated at -20° C; stable for one year from the date of shipment.

RESEARCH USE

For research use only, not for use in diagnostic procedures.

PROTOCOLS

See our web site at www.scbt.com or our catalog for detailed protocols and support products.